

RECOMMENDATIONS FOR RISK ASSESSMENT FISH CONSUMPTION RATES AND OTHER EXPOSURE CONSIDERATIONS

MTCA Science Advisory Board

December 14, 2007



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Background

- ❖ *Site eligible for NPL listing*
- ❖ *Deferral of listing*
- ❖ *MTCA cleanup process*



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Deferral Agreement

- ❖ Defers the decision to list the Site on the NPL while the State oversees cleanup under MTCA.
- ❖ Signed by EPA, Ecology, and the LEKT.
- ❖ Ensures cleanup will be "CERCLA-protective" and all actions will meet or exceed CERCLA requirements.
- ❖ Identifies roles and responsibilities.



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Deferral Agreement

The Tribe has interests in protecting its treaty fisheries, its cultural resources, and the health of its members from releases originating at the Site and in **providing recommendations, consistent with State and EPA procedures, concerning risk assessment procedures** that take into account the Tribe's dependence on affected fisheries and exposure scenarios for tribal receptors.



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Risk Assessment Procedures

- ❖ MTCA
- ❖ EPA RAGS
- ❖ *Local tribal fish consumption surveys*
- ❖ *Tribal input and interviews*
- ❖ EPA Region 10 framework



EPA Region 10 Framework

"Framework for Selecting and Using Tribal Fish and Shellfish Consumption Rates for Risk-Based Decision Making at CERCLA and RCRA Cleanup Sites in Puget Sound and the Strait of Georgia"



Application of EPA Framework

- ❖ *CERCLA / RCRA cleanup sites*
- ❖ *Puget Sound / Strait of Georgia*
- ❖ *Regional tribal consumption surveys*
 - *Tulalip Tribes*
 - *Suquamish Tribe*
- ❖ *Potential risks from site-related releases*



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Key Considerations

- ❖ *Hierarchy of preferred data sources*
- ❖ *Current conditions as predictors of future conditions*
- ❖ *Use of substitute fish and shellfish sources ("resource switching")*
- ❖ *Use of anadromous fish data*
- ❖ *Use of child-specific consumption rates*
- ❖ *Other exposure considerations*



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Framework Flow Chart

- ❖ **Step 1:** Select basis for tribal fish and shellfish consumption rate.
- ❖ **Step 2:** Select fish and shellfish consumption rate.



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Framework Flow Chart – Step 1

Box PS-1: Are Puget Sound / Georgia Strait fish and shellfish consumption studies relevant to the Tribe?

- ❖ No tribal-specific study
- ❖ Culturally similar
- ❖ Geographically similar

If Yes, Go to Box PS-2.



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Framework Flow Chart – Step 1

Box PS-2: Does the site or its environs have (existing or potential) high quality physical habitat to support substantial shellfish harvest in the absence of contamination?

- ❖ Existing habitat
- ❖ Tribal input

If Yes, the Suquamish Tribe data may be used as the basis for the consumption rate.



Framework Flow Chart – Step 2

Box PS-9: Select the fish and shellfish consumption rates corresponding to the information source selected in Step 1.

❖ Salmon	183.5 grams/day
❖ Pelagic Fish	56.0 grams/day
❖ Bottom Fish	29.1 grams/day
❖ Shellfish	498.4 grams/day
❖ Total Ingestion Rate	766.8 grams/day



Framework Flow Chart – Step 2

Box PS-10. Select a mix of categories or species of fish and shellfish to reasonably represent consumption patterns, while holding constant the total consumption rate.

❖ Salmon	24%
❖ Pelagic Fish	7%
❖ Bottom Fish	4%
❖ Shellfish	65%



Framework Flow Chart – Step 2

Box PS-11. Salmon.

A decision must be made to include or exclude risks associated with consumption of salmon on a site-specific and contaminant-specific basis.



Framework Flow Chart – Step 2

Box PS-12. Additional contaminant and aquatic life issues.

This step may be used in consultation with a fish biologist or other expert to determine whether it is appropriate to reduce estimates of site-related risks due to consumption of fish.



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Recommendations

- ❖ Use EPA Region 10 Framework approach
- ❖ Use Suquamish consumption data
- ❖ Exclude risks from salmon
- ❖ Use diet fraction of 100 percent
- ❖ Use lifetime exposure duration
- ❖ Use adult body weight from Suquamish



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Comparison of Exposure Factors

Exposure Factor	MTCA Default (Equation 730-2)	LEKT Recommended
FCR	54 grams/day	583 grams/day
FDF	50%	100% (% from PS)
ED	30 years	70 years (lifetime)
EF	350 days/year	365 days/year
ABW	70 kg	79 kg
AT	75 years	70 years (lifetime)



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Uncertainties

- ❖ *Suquamish data*
- ❖ *Salmon exclusion*
- ❖ *Percent from Site*
- ❖ *Exposure duration / frequency*



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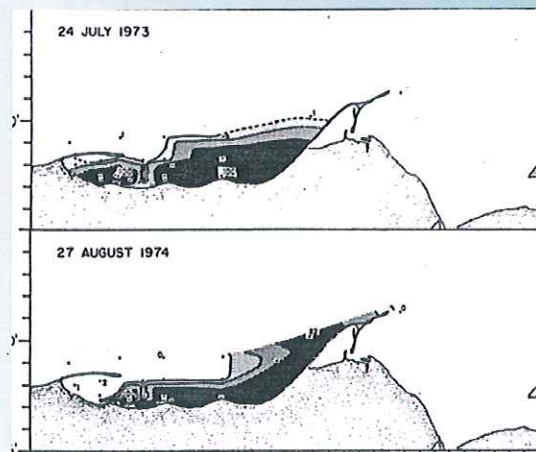
Implications

- ❖ Combining recommended exposure assumptions, Tribal exposure would be more than 60 times higher than assumed by the MTCA default values.
- ❖ Consequently, a cleanup based on MTCA default values would expose Tribal fish consumers to 60 times more risk than acceptable under MTCA.



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Extent of Effluent Toxicity



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Klallam Village Sites



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